

SECTION 4: RECOMMENDATIONS AND DISCUSSION ISSUES

Recommendations

1. Revise 14 CFR 1.1 Definitions as follows:

Alteration means a planned change in type design.

Major repair means a repair:

- (1) Where the damage to be repaired, or the proposed repair, will significantly² affect aircraft weight, balance, structural strength, performance, powerplant operation, flight characteristics, or other qualities affecting airworthiness; or
- (2) Where the complexity of the repair will significantly affect, weight, balance, structural strength, performance, powerplant operation, flight characteristics, or other qualities affecting airworthiness; or
- (3) That is not done according to accepted practices and cannot be done by elementary operations.

Major alteration means an alteration not listed in the aircraft, aircraft engine, or propeller specifications that:

- (1) Significantly affects weight, balance, structural strength, performance, powerplant operation, flight characteristics, or other qualities affecting airworthiness; or
- (2) Is not done according to accepted practices and cannot be done by elementary operations.

Repair means the elimination of damage or restoration of a damaged airframe, powerplant, propeller, appliance, or part thereof.

Replacement means the removal and installation of an airframe component, powerplant, propeller, appliance, or part thereof, in conformity with the approved type design.

2. Revise § 43.14 to allow for an alternative approach to the major/minor classification that is approved by the Administrator and is based on the § 1.1 definitions. The lists in part 43, Appendix A, are presumed to be major in lieu of the use of an alternative methodology.
3. Revise part 43, Appendix A as proposed in appendix 3 of this Report.

² Some Working Group members are concerned that the use the word "significant," as a replacement for "appreciable," might be in conflict with the recent FAA final rule and advisory circular regarding type certification procedures for changed products (see 65 FR 36244, June 7, 2000 and 65 FR 51052, Aug. 22, 2000). The changed products final rule relies on the introduction of two new classification terms, substantial and significant, to drive the determination of the certification basis to be used for a modification or derivative aircraft. Other Working Group members disagree that there is a potential conflict here. In the changed product rule, the word "significant" is used to modify the change; while in the Major/Minor proposal "significant" is used to modify characteristics affecting airworthiness.

4. Training of FAA Inspector.

The Working Group believes that a large part of the problem with the classification of major versus minor repairs and alterations is related to the inconsistency of enforcement by FAA inspectors. The Working Group recommends that the FAA develop additional guidance material (handbooks, checklists) to be used by the FAA inspectors. The Working Group believes that such materials could be developed by a group such as itself. Advisory material, including but not limited to the inspectors handbooks should incorporate the reasoning outlined by the Working Group. More training, guidance and general education is needed for the inspectors than is currently provided by the AC.

5. Advisory Circular

The Working Group recommends the issuance of the Advisory Circular 43.XXX, Repair And Alteration Data that appears in appendix 1 of this Report. The Working Group believes that AC 43.XXX works in concert with the proposed changes to part 43 Appendix A. If the Appendix A changes go forward without the AC the result would be unworkable.

Discussion Issues

1. 14 CFR 1.1 Definitions

The Working Group raised the concern that the recommended definition focuses on the damage whereas the current definition focuses on the repair task. The concern is that the analysis loses the effect of the repair itself. This may be covered by the data issues addressed in the AC.

Technology changes also have consequences for the classification of a rule. Some maintenance shops could presumably have greater expertise for accomplishing the repair task. The process for determining the classification of the repair may be the same for each airline but the conclusions reached may be different because of the different variables brought to the project by the different carriers.

2. Memo from Carey Terasaki, Manager, Airworthiness Law Branch, March 13, 2000

The Working Group raised some concerns about the notion (raised in GC memo) that every single repair should be classified the same across the board. Operators may not come to the same conclusions about repair classification for similar types of damage. The Working Group does not agree that it is necessary for all repairs will be classified the same throughout the industry.

While two repairs may be identical the damage that drives the repairs may be different, and therefore the classification of the repairs may be different. The classification of a repair must account for the peripheral issues related to the damage, the consequences of performing the repair, and the methodology used to approve the repair data. Because air carriers and repair stations use different methodologies to approve repair data the Working Group tried to craft the NPRM to allow for these differences. A goal of the NPRM was to provide an alternative means for making the Major/Minor determination so as to exempt certain entities from requirements of Appendix A.

The appendix was likened to tax schedules that itemize deductions as opposed to those that apply a standard deduction. The list of major repairs and major alterations in Appendix A of part 43 would be similar to the standard deduction. A mechanic would use the list in Appendix A to provide a simple answer for major versus minor determinations. The list of repairs and alterations in Appendix A are presumed to be major. However, by using the analysis in proposed § 43.14 this presumption can be overcome. Using the analysis of § 43.14 is like opting for the itemized deduction. The § 43.14 analysis requires the person to apply the § 1.1 definition of major repair and major alteration based on a methodology approved by the Administrator. The Working Group believes this kind of alternative scheme is necessary and appropriate. The Working Group believes that the determination of major versus minor is often dependent on several factors, such as:

- Airplane characteristics
 - Operation limitations
 - Model
 - Design
 - Type of operation (91 vs. 121 vs. 135)
 - Expertise (skill/training) of the maintenance organization
 - Mechanic,
 - Engineer,
 - Repairman
3. Some members of the Working Group wanted a listing in the AC or Appendix A that would cover minor repairs. Such a list existed in the old CAM 18.
 4. Canadian and JAA Harmonization:

The Working Group has struggled with the issue of harmonization.
 5. Replacement of Parts
 6. Maintenance Definition –

The definition of maintenance includes replacement and repair, but does not differentiate between the two.

Replacement in the context of a repair is a subset of repair, which is consistent with the dictionary definition of repair.

7. Separation of Data from Performance -

The current § 1.1 definitions do not differentiate between the data issues and the performance issues involved in repairs.

The Working Group struggled with the fact that the part 43 performance rules specifically address the relevant performance concerns for a repair. The FAA claims that the 43 performance issues are different than the performance issues addressed in the 14 CFR 1.1 definition, however, the Working Group does not see such a clear distinction.

Current § 43.3 suggests that the Appendix A lists “are” the major repairs rather than addressing the Appendix as examples of major repairs. The Working Group recommends that this reference be clarified.

The Working Group has proposed that Appendix A repairs are presumed to be Major but can be determined otherwise.

The part 43 Appendix focuses on the mechanic and does not appropriately take into account the systems in which the mechanics operate.

8. Consequence of using Approved Data

The Working Group believes the FAA should clarify when approved data must be used and when approved data may be used. Major Repairs must have technical data approved by the Administrator, however, just because approved data exists and is used does not mean that the repair which relies on this data is a major repair. Some FAA inspectors have used this circular logic to determine that a repair is major merely because the mechanic performing the repair used approved data.

Manufacturers often develop data that is Designated Engineering Representative (DER) approved to support their maintenance manuals for their aircraft. Any repair (major or minor) can utilize approved data. Only major repairs must use approved data. Minor repairs may use approved or acceptable data. Often inspectors will look at a minor repair and treat it as a major repair merely because a similar repair is covered by a structural repair manual (SRM). A repairman performing a minor repair should be permitted to use the SRM as guidance without fear of becoming bound by the use of “approved data.” For minor repairs the repairman may follow the guidance of the airline maintenance manual, even if such guidance is inconsistent with the SRM. (43.13(a) and (c))

Currently no approved data exists for many critical process systems (complex operations) which are considered major repairs under Appendix A (e.g. there is often no approved data for overhauls). According to Appendix A paragraph (b)(2)(i) one would need approved data to take an engine apart but not to put it together.

The determination of major and minor, under the current rules, does not become relevant until the repair entity fails to find an answer in Appendix A. If the answer is found in Appendix A then the person never looks at the definitions in 1.1.

9. When data becomes approved does the repair become minor?

Once a major repair is accomplished and the data becomes approved does a subsequent similar repair become minor because it is now an elementary operation? One objection to this is that the repair is still missing the authorized inspection. Approved data does not absolve one from the need for inspection/second set of eyes and record keeping.

The Working Group believes that the precedence of a major repair (creating approved data) should not permit subsequent similar repairs to become minor. Previously approved data may be applied to the subsequent repair if it is determined to be appropriate and applicable, but the repair will remain classified "major." The recommended definition covers this problem by addressing the damage precipitating the repair.

10. Is Appendix A more appropriately AC material?

The Working Group discussed the possibility of removing Appendix A from part 43 and putting it in an AC. The items in Appendix A were originally derived from advisory CAM 18 material during the 1964 recodification. At the time the intention was that the FAA would periodically update the Appendix as necessary. However, the list of major repairs in Appendix A have not been kept current. The Working Group concluded through compromise with the ARAC that Appendix A should remain in the rule. Some members of the Working Group want the Appendix A lists to remain as part of the rule to prevent ambiguity and therefore alleviate unnecessary enforcement actions.

11. Should references to "primary structure" in part 43 Appendix A be replaced with "principal structural element"?

The working group is divided on this matter. Principal Structural Elements (PSE's) are a subset of Primary Structure. The Advisory Circular developed by the Working Group considered Primary Structure when developing the logic process. Applying only Principal Structural Elements to the logic criteria warrants a reassessment of the data development logic process.

12. Specific Examples that the current rules fail to address:

- Replacements (or perhaps alterations) that deviate from type design.
- Replacement of a single rivet is not a major repair.
- Replacements that conform to the type design are simple maintenance processes, but the failure to accomplish properly can result in catastrophic events. (Today's Rule) For example, replacement of control cable is classed minor and has been for 50 years without record of any needed change. Appendix A, paragraph (b) can be interpreted to exclude the above but current § 1.1 catches you.